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(54) RIVETTED JOINT CONSTRUCTION

(71) GIRLOCK LIMITED

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(74) RI

(56) 59825/69 448973 71.6 78.1 73.2
7608/61 250789 70.6 73.2 78.9 78.3 71.5 71.6
74.5
41406/58 228379 78.1 78.9 74.5

(57) Claim 1. A joint construction joining a rod-like member requiring restraint against torsional loading, and a plate-like member, the plate-like member having in it a non-circular opening, the rod-like member the cross-sectional shape of which is non-complementary with that of the opening, having at one side of and abutting against one surface of the plate-like member a flange the dimensions of which are such that it will not pass through said opening, the rod-like member having a substantial degree of extension in at least one direction from the plate-like member and having adjacent the other surface of said plate-like member a portion deformed by swaging so that a part thereof lies within those parts of the opening not filled by the rod-like member to prevent relative rotation of the rod-like member in relation to the plate member about its axis and so that the remainder of said portion overlies the other surface of the plate-like member to act with the first mentioned flange to prevent relative movement in an axial direction of the rod-like member in relation to the plate-like member.

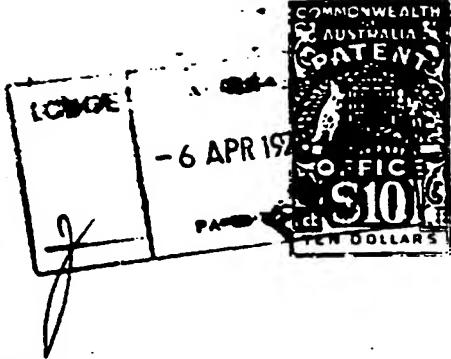
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 Declaration
 Specification
 Drawings

529170

4339079
COMMONWEALTH OF AUSTRALIA

Patents Act 1952-

~~CONVENTION~~
APPLICATION FOR A PATENT



We GIRLOCK LIMITED, a company incorporated under the laws of the State of New South Wales of 36 Harp Street, Belmore, New South Wales, Commonwealth of Australia

hereby apply for the grant of a Patent for an invention entitled

"JOINT CONSTRUCTION"

APPLICATION ACCEPTED AND ANNUAL FEES PAID

ALLOWED

11/3/87

which is described in the accompanying provisional specification.

COMPLETE AFTER PROVISIONAL SPECIFICATION NO 4339079

This application is a continuation application filed under section 195B of the Patents Act 1952. This application is based on an earlier application for a patent or similar protection filed

in

in

in

in

13 APR 1987

My address for service is: F. B. Rice & Co., 101 Mort St., Balmain, NSW 2041

Dated this 6th day of Apr 1978

GIRLOCK LIMITED

P. G. Frank

Patent Attorney

To: The Commissioner of Patents,
Commonwealth of Australia.

F. B. RICE & CO.
Patent Attorneys
Sydney.

BEST AVAILABLE COPY

**DECLARATION IN SUPPORT OF
AN APPLICATION
A CONVENTION APPLICATION FOR A
PATENT OR PATENT OF ADDITION**

In support of the Application
~~Convention Application~~ made by

GIRLOCK LIMITED

4339079

for a patent
~~of addition~~ for an invention entitled "Joint Construction"

I, Michael Cooper, Secretary of and care of the applicant company do solemnly and sincerely declare as follows:

(1) I am authorised by Girlock Limited

the applicant for the patent
~~of addition~~ to make this declaration on its behalf.

(2) The basic application xxxxx defined by Section 142 referred to in the application is as follows:

xxxxx

xx

xxx

by

(3) MR. BARRIE VIALS
14 CECIL STREET, DOLANS BAY. NSW. 2229.

is the actual inventor of the invention and the facts upon which the applicant company is/are entitled to make the application are as follows:

The applicant is a person who would, if a patent were granted upon an application made by the actual inventor be entitled to have the patent assigned to it, under the provisions of Section 34(1)(fa) of the act. The basic application referred to in paragraph 2 of this Declaration is/are the first application made in a Convention country in respect of the invention the subject of the application.

Declared at Sydney 1 this

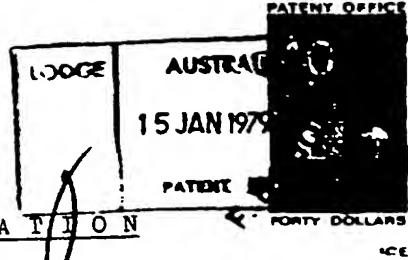
13 day of December 1978

Michael H. Cooper
Secretary

F. B. RICE & CO.,

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COMMONWEALTH OF AUSTRALIA
PATENTS ACT 1952



COMPLETE SPECIFICATION

(ORIGINAL)

43390/79

Class

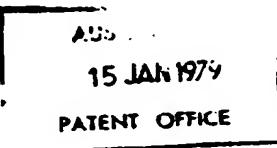
Int. Class

Application Number : PD3926/78
Lodged : 6TH APRIL, 1978

This document contains the
amendments made under
Section 49.

and is correct for printing.

Complete Specification Lodged :
Accepted :
Published :



Priorit :

Related Art :

Name of Applicant : GIRLOCK LIMITED

Address of Applicant : 36 Harp Street, Belmore, New South Wales,
Commonwealth of Australia

Actual Inventor : BARRIE EDWARD VIALS

Address for Service : F.B. RICE & CO.,
Patent Attorneys,
The Forth and Clyde,
101 Mort Street,
BALMAIN. 2041.

Complete Specification for the invention entitled:

"JOINT CONSTRUCTION"

The following statement is a full description of this invention
including the best method of performing it known to us :-

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This invention relates to a joint construction by means of which a rod-like member may be secured to a plate-like member in such a manner that it will both withstand torsional movement tending to twist it in relation to the plate-like member and axial forces tending to move it axially in relation to the plate-like member.

- The invention consists in a joint construction joining a rod-like member requiring restraint against torsional loading, and a plate-like member, the plate-like member having in it a non-circular opening, the rod-like member, the cross-sectional shape of which is non-complementary with that of the opening, having at one side of and abutting against one surface of the plate-like member a flange the dimensions of which are such that it will not pass through said opening, the rod-like member having a substantial degree of extension in at least one direction from the plate-like member and having adjacent the other surface of said plate-like member a portion deformed by swaging so that a part thereof lies within those parts of the opening not filled by the rod-like member to prevent relative rotation of the rod-like member in relation to the plate-like member about its axis and so that the remainder of said portion overlies the other surface of the plate-like member to act with the first mentioned flange to prevent relative movement in an axial direction of the rod-like member in relation to the plate-like member.

In order that the nature of the invention may be better understood a preferred form thereof is described with reference to and as illustrated in the accompanying drawings in which:-

- Figures 1a and b respectively show the two parts before assembly, the rod-like member and the plate-like member.

Figures 2a and b show sectional views of the swaging tool, the sections corresponding to the major and minor diameter of the oval hole respectively, and

- Figures 3a and b and 4a and b each show sections through

the major and minor diameters of the oval hole, before and after swaging respectively.

Referring to Figure 1a the rod-like member 10 is provided with flange 11 and enlarged portion 12. The flange 5 11 is shown in Figure 3 as lying underneath a plate 13 having in it a hole 14 which, as shown in Figure 1b is oval in plan. The enlarged portion of the rod-like member fits closely within hole 14 across its minor diameter (Fig. 3b) but has clearance across its major diameter (Fig. 3a).

To make the joint the parts are assembled as shown in Figures 3a and b and supported. The swaging tool 15, shown in two sections in Figures 2a and b, is then applied to swage the enlarged part 12 to the form shown in section, in Figures 10 14a and b. The effect of this is to fill the opening 14 with metal from the part 12. Owing to the non-circular nature of 15 the opening 14 this effectively prevents rotation of the rod-like member 10 about its axis in relation to the plate 13. As seen in Figure 4a however, a portion of material 20 from the part 12 is caused to overlie the plate 13 and rests with the flange 11 to prevent any axial movement of the rod-like member 10 in relation to the plate 13.

A joint construction according to the invention may be applied easily and economically in many situations in which 25 two parts having the characteristics described above are required to be joined under the conditions described.



The claims defining the invention are as follows:-

1. A joint construction joining a rod-like member requiring restraint against torsional loading, and a plate-like member, the plate-like member having in it a non-circular opening,
5 the rod-like member, the cross-sectional shape of which is non-complementary with that of the opening, having at one side of and abutting against one surface of the plate-like member a flange the dimensions of which are such that it will not pass through said opening, the rod-like member having a
10 substantial degree of extension in at least one direction from the plate-like member and having adjacent the other surface of said plate-like member a portion deformed by swaging so that a part thereof lies within those parts of the opening not filled by the rod-like member to prevent relative
15 rotation of the rod-like member in relation to the plate-like member about its axis and so that the remainder of said portion overlies the other surface of the plate-like member to act with the first mentioned flange to prevent relative movement in an axial direction of the rod-like member in
20 relation to the plate-like member.
2. A joint construction as claimed in Claim 1 wherein the said opening is oval.
3. A joint construction substantially as described with reference to and as illustrated in the accompanying drawing.

DATED this 28th day of February, 1983.

GIRLOCK PTY. LIMITED
Patent Attorneys for the
Applicant:

F.B. RICE & CO.



43390/79

FIG. 1a

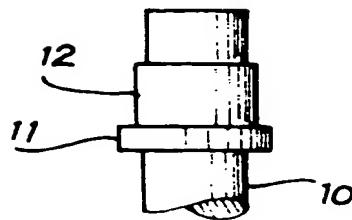


FIG. 1b

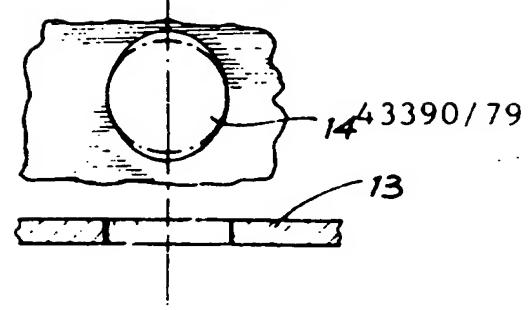


FIG. 2a

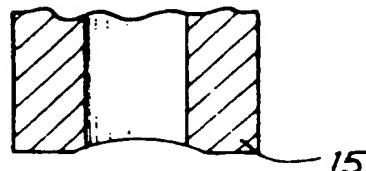


FIG. 2b

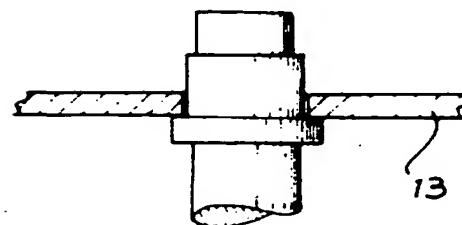
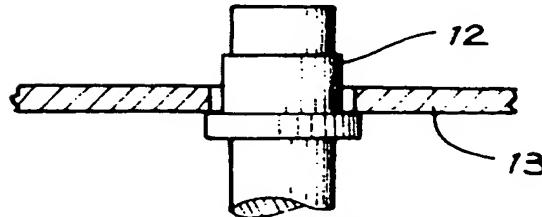
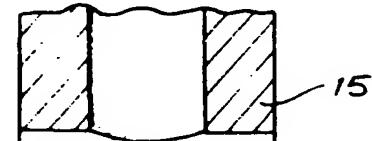


FIG. 3a

FIG. 3b

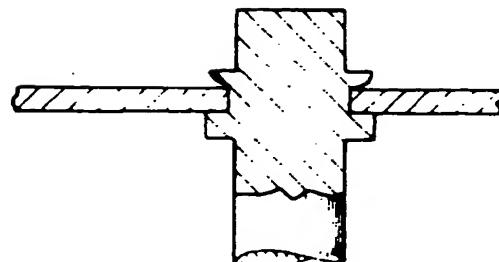
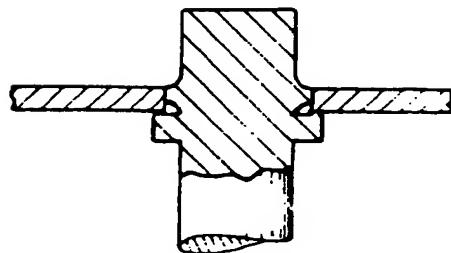


FIG. 4a

FIG. 4b